

**Partial English Translation of**  
**LAID OPEN unexamined**  
**JAPANESE PATENT APPLICATION**  
**Publication No. 10-256188**

[0038] [Second Embodiment] In the second embodiment, the same method as that in the first embodiment is employed except that the metal layer 38 is differently formed from that in the first embodiment. That is, the same steps as those described in Figure 1A to Figure 4K are performed in this embodiment. Further, regarding formation of the metal layer 38 in the Figure 4L, the surface thereof is treated with hydrofluoric acid for cleaning it in the same manner as in the first embodiment and then, the metal 38, which forms silicide later by reacting with Si, is formed in a manner that a Co layer is supplied with a power of 0.5 kW at a temperature of 150 °C and Ar is supplied at 100 sccm, for example, and sputtering is performed at a pressure of 0.47 Pa so that a metal layer is formed to 30 nm. Next, the first thermal treatment is performed by a RTA at a temperature of 550 °C for 30 seconds, in which a N<sub>2</sub> gas is supplied at 5 slm and a halogen lamp is used. As a result of this thermal treatment, Co in the metal layer 38 reacts with the first silicon layer 24 and the gate electrode 32 made of the second silicon layer 31, so that silicide such as CoSi<sub>2</sub> is formed. Thereafter, non-reacting Co, that is, Ti which remains without becoming silicide, is removed by being immersed in a sulfuric acid peroxide mixture, as shown in Figure 5M. Then, the second thermal treatment is performed by a RTA at a temperature of 700 °C for 30 seconds, in which a N<sub>2</sub> gas is supplied at 5 slm and a halogen lamp is used, so that stable CoSi<sub>2</sub> is formed. After this silicide layer formation, the semiconductor device is fabricated in the same steps and manner as in the first embodiment.